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FURTHER ANALYSIS OF THE VOICE SIGN IN CHOREA *

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Elsewhere¹ I have reported in a short preliminary note on the voice in chorea as analyzed by the aid of the vocal kymograph. This was merely the first blush, the original snap-shot of a single isolated case.

That note briefly reviewed the literature since 1841, showed the vagueness of former descriptions of choreic vocal changes, the antiquated methods of vocal analysis, the advantages of modern methods, and finally presented — as far as I know — the first clear statement of just what choreic voice is. Without reiterating at length the details of that preliminary note, let me briefly state that the voice-change as reported on the kymograph consists in a variation in two vocal elements — a rise in pitch and an increase in intensity. This vocal change was so constant and so uniformly simultaneous with other choreiform movements that I there presented the claim that these vocal changes deserved at least to be classed with Shaw's² knee-jerk in chorea and with Graves'³ respiratory signs in chorea, and should therefore in routine clinical examination be called the voice sign in chorea.

From the start I felt that the preliminary note should be followed up by a variety of tests carried uniformly through a long series of cases in order to ascertain the varieties of the voice sign in different aspects of the disease — early, marked, late, recovered, partial and hemichorea — as well as to ascertain if change in pitch and vocal intensity were the only effects of choreic movements on vocal utterance; also the varieties of these in different stages and forms if any.

It is the procedures and results of this research that I now present. Let me here express my appreciation to Prof. John J. Thomas for opportunity to carry on this investigation.

*Read before the Section on Nervous and Mental Diseases at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

*From the Neurological Department of Boston City Hospital, Service of Prof. John Jenks Thomas.

1. Swift, Walter B.: A Voice Sign in Choreia: Preliminary Note, *AM. JOUR. DIS. CHILD.*, June, 1914, p. 422.

2. Shaw, H. L. K.: The Knee-Jerk in Choreia, *Albany Med. Ann.*, May, 1897.

3. Graves, W. W.: A Study of the Respiratory Signs of Choreia Minor, *The Journal A. M. A.*, Jan. 30, 1909, p. 364.

In conversation, vocal changes are short in duration, and hence difficult of perception. This suggested the prolongation of tests to make vocal change more easily perceived. The change recorded from prolonged tests must necessarily be the same changes elongated that occur in conversation, where the sounds are short.

Twenty cases were then subjected to the following series of twenty-seven tests, 540 tests in all:

1. Prolonged utterance of a as in arm.
2. Prolonged utterance of e as in eye.
3. Prolonged utterance of i as in ice.
4. Prolonged utterance of o as in old.
5. Prolonged utterance of u as in rude.
6. Prolonged utterance of a as in ask.
7. Prolonged utterance of e as in end.
8. Prolonged utterance of i as in ill.
9. Prolonged utterance of o as in odd.
10. Prolonged utterance of u as in up.
11. Consonant p.
12. Consonant b.
13. Consonant m.
14. Consonant t.
15. Consonant d.
16. Consonant n.
17. Consonant k.
18. Consonant g.
19. Consonant r.
20. Consonant l.
21. Consonant s.
22. Prolonged whisper.
23. Prolonged whistle.
24. Blowing the breath.
25. Holding the breath in inspiration.
26. Holding the breath in expiration.
27. Holding the breath in half expiration.

The purpose in trying so many tests was to expose all the forms and modes of vocal production to the choreic twitch, and in this way ascertain the mode and form acted on with highest frequency to serve as a single test adapted to routine clinical examination.

SYMPTOM FREQUENCY IN TWENTY CASES

After tabulating 20 cases of supposed chorea, 4 were found recovered, and 1 a question of hysteria. Excluding those 5, 15 are left, of certain diagnosis on which to base results.

In general, variation in pitch and intensity occurred in two-thirds of the cases pretty uniformly distributed over all the vowel sounds, long and short, with a slightly more frequent change in pitch than intensity. Therefore I place pitch first in mentioning them. There is, however, one marked difference in all these vowel changes. Long "a" is more marked in its change. This is a good reason for its choice

as the routine clinical test. The explanation may lie in the open position of vocal agents in the utterance of "a" long, as in "are," thus allowing any contraction to show more in its effect, than if exerted on a closed position of those agents as "e" in "end."

The whisper changed in pitch in 3 cases, in intensity in 6, showing periodic cessation in 3. The whistle showed irregularity in 3 on expiration, and in 3 cases on inspiration. One case entirely stopped whistling. Three cases could never whistle. One showed periodic cessation of tones, with no change in pitch or intensity determinable.

Consonants showed no change except when prolonged, where three cases showed "e" and "r" to change in pitch and intensity.

Air blow : 4 cases were irregular ; 3 halting.

Air held in inspiration, no change.

Air held in expiration showed one puff.

Air held in half expiration showed one puff.

OTHER SIDE OBSERVATIONS NOTED IN THE 540 TESTS OF TWENTY CASES

Cases recovered in from three to five months showing no voice sign.

Also one case recovered in eight months showed no voice sign.

The frequency of occurrence slightly increased with the increase of fatigue.

Once was observed a nasal puff of air, simultaneous with a choreic twitch, mouth closed.

One relapsed case with motions in limbs only showed no voice sign whatever.

One case hemichorea showed vocal changes, like the others.

One case with a uniform and constant vowel variation in pitch and intensity, and that, too, in all the vowels tested showed no vocal change in prolonged "l" and "r."

Voice changes not always in proportion to the amount of choreic motion as seen.

With air held in inspiration, expiration and half expiration, slight movements showed no change in 8 cases.

Marked timidity and slight questionable voice changes should not be counted as positive change.

Slight lack of articulation control or inattention may contribute slight negligible voice changes.

Marked contractions accompany marked voice change.

CONCLUSIONS FROM TWENTY CASES

1. These choreic voice changes are more frequent in the vowels, less so in whisper, whistle, consonants, air blow and holding of breath; and are less and less in frequency in this order.

2. There is sufficient uniformity and frequency in the appearance of vocal changes to warrant us in classifying changes of pitch and intensity as one of the signs of chorea ; of equal dignity with the choreic knee-jerk of Shaw,² the respiratory signs of Graves³ and other minor symptoms.

3. Other less frequent and less marked changes occur that seem of interest subordinate to those in the vowels.

4. The most marked change occurred in the open prolonged sound of "a" as in "are," and I therefore offer this as the routine clinical test and method for the elicitation of the choreic voice sign.

SUMMARY

Analysis of twenty cases of chorea with over five hundred observations on the voice show a change of pitch and intensity in two cases out of three — a change that deserves recognition as a new sign in chorea — the choreic voice sign.

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